REMARKS

Independent Claims 1 and 10 are revised in a further effort to define over the applied art. New Claim 11 is added to further define the thermoplastic resin of parent Claim 1, and new Claim 12 is added to reintroduce the product-by-process limitations removed from Claim 1 by the current amendments. Claims 1-3 and 5-12 remain, with no claim previously allowed.

Claims 1-3, 5-8, and 10 stand rejected as anticipated by, or as obvious over, *Mamish* (US 5,227,225). The applicant respectfully traverses these rejections.

The examiner has commented on the product-by-process limitation "impregnated by dipping or spraying a thermoplastic resin..." in the claims, pointing out that process limitations receive no patentable weight in an article claim. Accordingly, Claims 1 and 10 are here revised with positive recitations that the nonwoven fiber material is imbued with a thermoplastic resin having a particular basis weight and impregnating the nonwoven material without coating the surface of that material. The adhesive tape having the limitations of the amended claims thereby prevents penetration of the adhesive coating through the nonwoven fiber material, and achieves cohesion of the fibers making up that material. The applicant respectfully submits that Claims 1 and 10, as here amended, contain positive structural limitations, and that all claims define over *Mamish*.

Support for the nature and scope of the terms "imbue" and "impregnate" were previously submitted by the applicant. Please see also page 1, lines 14-16 of the specification for discussion of impregnation with a thermoplastic resin and disclosing that cohesion of the nonwoven fibers is achieved by resin impregnation according to the invention. Support for the limitation that penetration of the adhesive coating through the

nonwoven material is prevented by impregnating the nonwoven material appears at page 3, lines 1-3, and in the final paragraph on page 2 of the specification.

Mamish discloses a masking tape prepared by coating a thin layer of a polyolefin onto one side of a nonwoven cloth and then applying a layer of adhesive onto the opposed surface of the cloth. *Mamish* makes clear that his polyolefinic backing layer "will both coat the surface of the cloth and invade its interstices" (column 1, lines 57-60). The applicant's claimed adhesive tape, as previously argued, impregnates the nonwoven material with a thermoplastic resin without coating the surface of the nonwoven material with that resin. This arrangement prevents penetration of the adhesive coating through the nonwoven material and also achieves cohesion of the fibers making up the nonwoven material.

Concerning the previous discussion between the examiner and the undersigned regarding whether *Mamish* teaches a single layer or a two-layer backing material, it appears he considers his polyolefin backing layer as a "a two-layer backing consisting essentially of an outer layer of HDPE and an inner layer of LDPE" (column 2, lines 29-32). See also column 2, lines 58-60 for the benefits of a two-layer backing, according to *Mamish*. Further evidence of just how *Mamish* perceives his invention appears in Claim 1 of that patent, where he defines his tape as consisting essentially of "an outer layer of high density polyethylene; an inner layer of low density polyethylene...; a nonwoven cloth; and a pressure-sensitive adhesive layer...".

Whatever the meaning of *Mamish's* statement that the "nonwoven is not present as a discrete layer" (column 1, lines 56-57), the applicant again submits that one of ordinary skill would take from *Mamish* a teaching of a four-layer adhesive tape as

mentioned throughout that reference and as defined in its broadest claim. His polyolefinic backing layer exists as a coating on the surface of the cloth, and preferably consists of the outer and inner layers mentioned above. His tape includes, in addition, a nonwoven layer and an adhesive layer. The applicant's invention, in contrast with *Mamish*, consists essentially of a nonwoven layer, a thermoplastic resin imbued in the nonwoven layer, and an adhesive layer. *Mamish* does not disclose a tape consisting essentially of those elements as claimed, and *Mamish* thus does not anticipate the tape defined by those claims.

The examiner has questioned how the applicant calculated a basis weight of 9.58 g/m^2 for the minimum thickness layer disclosed by *Mamish*. In response, the undersigned refers to the enclosed two-page calculation sheet presented by the applicant. These calculations are based on a prior-art layer thickness of about 10 µm disclosed in the previously-submitted CN1344616 abstract. The reason why that limit has been used for the calculation (and not the value of 1.5 mils according to *Mamish*) is that while *Mamish* —as stated by the examiner— is silent about a minimum thickness value, CN '616 describes such a thickness minimum value which can be reached by coextrusion, i.e. the only application method disclosed by *Mamish*. The layer thickness of about 10 µm thus represents the lowest thickness value which can be reached by coextrusion, as known to the applicant from the literature.

Mamish discloses in Table 1 density values from 0.917 g/cm^3 to 0.598 g/cm^3. Those values are reproduced on page 1 of the enclosure.

The calculation of the basis weight of impregnation (bwi) on page 2 of the enclosure starts from a cube representing the density definition (1) applied to *Mamish*,

then goes to the mass of a cuboid with an area of 1 m^2 of the basis surface and with a thickness of 1 cm (2) and finally, ends with the same cuboid but having the thickness of 10 μm according to CN '616.

The relevant formula for the calculation is:

bwi = p x d,

where p is the density and d the layer of thickness.

The absolute minimum density value of 0.917 g/cm^3 of *Mamish* would lead to a limiting specific weight bwi of 9.17 g/m^2. However, the present invention claims a specific weight of 1 to 5 g/m^2, which in any case is lower than 55 percent of 9.17 g/m^2.

The density value 0.598 g/cm^3 has been used for the applicant's calculations because that value is closer to the present invention, where preferably acrylate resins for polyurethane resins (cf. the present specification, middle of page 2) are used, which have a density of about 1.2 g/cm^3.

Using a thickness value of *Mamish* leads to a greater bwi value. Thus, the applicant has used the "best mode", in other words —in view of the patentability of the present invention— the "worst case" deriving from the prior art.

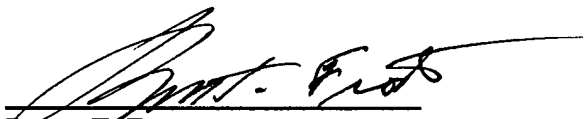
It can thus be understood that a coating resin with a basis weight (bwi) of 1 to 5 g/m^2 —as claimed herein— would neither be sufficient for coating the surface (as taught by *Mamish*) embedding the light weight nonwoven, nor be applicable by the coextrusion process described by *Mamish*. For accomplishing those results, the basis weight should have at least about double that value, as seen from the calculation. Using acrylate resins or polyurethane resins, that value should be at least about 12 g/m^2.

Accordingly, the applicant respectfully contradicts the examiner's statement "that the teachings of prior [art] actually appear to support the feasibility of a thinner coating...". The applicant further submits that a textile adhesive tape wherein the nonwoven fiber material is imbued with a thermoplastic resin having a basis weight of 1 to 5 g/m^2, together with other limitations recited in Claims 1 and 10, is both novel and non-obvious in view of *Mamish*.

The foregoing is submitted as a complete response to the Office Action identified above. The Applicant respectfully submits that the present application is in condition for allowance and solicits a notice to that effect.

Respectfully submitted,

MERCHANT & GOULD



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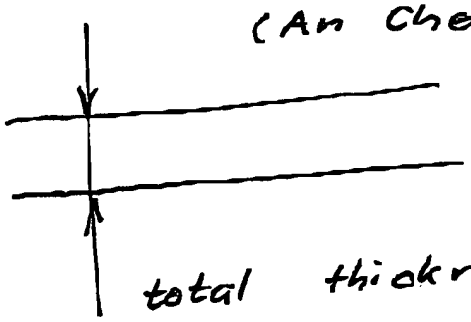
Roger T. Frost
Reg. No. 22,176

Merchant & Gould, LLC
P.O. Box 2903
Minneapolis, MN 55402-0903
Telephone: 404.954.5100

Enclosure - page 1

* Prior Art layer thickness
GM 1344616
(An Chengqiang et. al)



total thickness 10 - 200 microns

minimum thickness $d_{min} = 10\ \mu m$

d = thickness

* Prior Art density of backing layer
US 5,227,225
(Mamish)

table 1

ρ_{PE} : LDPE 0,917 g/cm^3
- 0,923 -"-

HDPE 0,958 g/cm^3

maximum density $\rho_{max} = 0{,}958\ \frac{g}{cm^3}$
minimum density $\rho_{min} = 0{,}917\ \frac{g}{cm^3}$
ρ = density

Enclosure – page 2

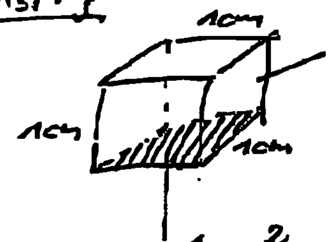
m = mass

V = volume

F = area

bwi = basis weight of impregnation

① definition Density ρ



⇒ 0,958 g (Chamisch) — ρ_{max} prior art

0,917 g — ρ_{min}

$$\rho = \frac{m}{V} = \frac{m}{F \cdot d}$$

$$\rho = \frac{bwi}{d}$$

with

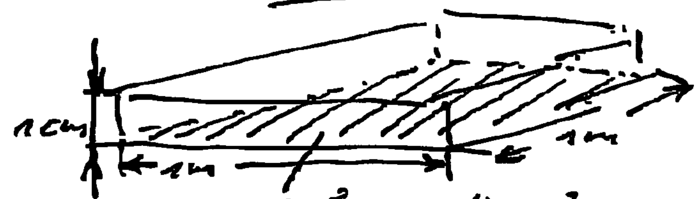
$$bwi = \frac{m}{F}$$

$$bwi = \rho \cdot d$$

$bwi_{min} = \rho_{min} \cdot d_{min}$

$bwi_{min} = 9,17\ g/m^2$

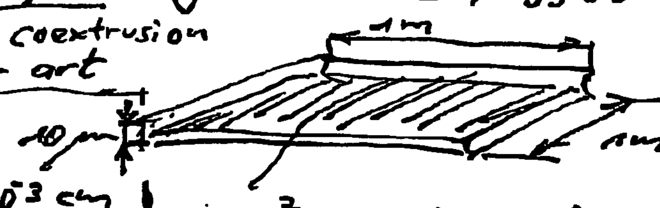
⇒ ② 1 m²



$1m^2 = 10^4\ cm^2$

⇒ 9170 g (min)
9580 g (max)

③ 10 µm d_{min} coextrusion prior art = 10^{-3} cm (An Chengiang)



⇒ 9,58 g (max)
9,17 g (min)

$bwi = 9,58\ g/m^2$ (close to invention)